excepting even the *Camelidæ*. It is only during the earlier period of intra-uterine life that the corpuscle of mammals has a nucleus corresponding to the permanent one in the corpuscle of lower animals. In birds, the nucleus, when exposed by a weak acid, is commonly longer in proportion to its breadth than the envelope; but there are some exceptions, and the nucleus becomes globular or nearly so when in contact with water. In the blood-corpuscle of mammals the central spot, so often mistaken for a nucleus, is not visible in the best focus and light; then if the object-glass be so slightly removed from the corpuscles as not to destroy their clear contour, a dark spot appears in their centre; if the glass be next so far moved towards the corpuscles as to place them slightly within the focus, the dark spot will become bright; and when altogether invisible in a bright light, the spot may be instantly brought into view simply by diminishing the light.

Note.—The following measurements are all in vulgar fractions of an English inch; but for the sake of convenience, the numerator is omitted throughout, as it is invariably 1, and the denominators only are printed. The measurements of the blood-discs are given as they lie flat, unless when a T indicates a measurement of their thickness. By L.D. the long diameter and by S.D. the short diameter is denoted. The measurements refer exclusively to average sizes. The nuclei were measured after exposing them by the action of dilute acetic acid on the envelopes.

MAMMALIA.

Homo	3200
T...	12400
Simiæ Catarrhini.	
Simia Troglodytes	3412
Pithecus Satyrus	3383
Hylobates Hoolock	3368
—— leucogenys	3425
—— Rafflesii	3539
Semnopithecus Maurus	3515
Cercopithecus Mona	3468
—— sabæus	3342
—— fuliginosus	3530
—— ruber	3395
—— pileatus	3578
—— pygerythrus	3401
—— Petaurista	3478
—— griseo-viridis	3429
—— Æthiops	3454
Macacus radiatus	3563
—— Rhesus	3429
—— niger	3583
—— cynomolgus	3429
—— Silenus	3430
—— nemestrinus	3493
—— sylvanus	3338
—— melanotus	3389
Cynocephalus Anubis	3461
—— leucophæus	3555
Simiæ Platyrrhini.	
Ateles subpentadactylus	3620
Ateles ater	3602
—— Belzebuth	3589
Cebus Apella	3467
—— capucinus	3454
Callithrix sciureus	3713
Jacchus vulgaris	3624
Midas Rosalia	3510
Lemuridæ.	
Lemur albifrons	3976
—— Catta	3892
—— Anjuanensis	4003
—— nigrifrons	4440
Loris tardigradus	3691
—— gracilis	3461
Cheiroptera.	
Vespertilio murinus	4175
—— noctula	4404
—— Pipistrellus	4324
Plecotus auritus	4465
Insectivora.	
Talpa Europæa	4747
Erinaceus Europæus	4085
Sorex tetragonurus	4571
Plantigrada.	
Meles vulgaris	3940
Arctonyx collaris	3609

MAMMALIA—(*continued*).

Ursus maritimus	3870
—— Arctos	3723
—— Americanus	3693
—— Americanus, var.	3782
—— ferox	3530
—— labiatus	3728
Helarctos Malayanus	3562
Mellivora Capensis	3824
Procyon lotor	3950
Nasua fusca	3789
—— rufa	3878
Basaris astuta	4033
Cercoleptes caudivolvulus	4573
CARNIVORA.	
Paradoxurus leucomystax	4236
—— Bondar	5693
—— binotatus	4660
—— Pallasii	5485
Canis familiaris	3542
—— Dingo	3395
—— Vulpes	4117
—— fulvus	3920
—— argentatus	3888
—— cinereo-argenteus	3761
—— lagopus	3888
—— aureus	3860
T...	14000
—— mesomelas	3645
—— Lupus	3625
Lycaon tricolor	3801
Hyæna vulgaris	3735
—— crocuta	3820
Herpestes griseus	4662
—— Javanicus?	4790
—— Smithii	4466
Viverra Civetta	4274
—— tigrina	5365
Felis Leo	4322
—— concolor	4465
—— unicolor	4481
—— Tigris	4206
—— Leopardus	4319
—— jubata	4220
—— pardalis	4616
—— domestica	4404
—— Bengalensis	4419
—— Caracal	4684
—— cervaria	4220
—— Serval	4129
Galictis vittata	4175
Mustela Zorilla	4270
—— Furo	4134
—— vulgaris	4205
—— Putorius	4167
Lutra vulgaris	3502
Phoca vitulina	3281
CETACEA.	
Delphinus Phocæna	3829
Balæna Boops	3099
PACHYDERMATA.	
Sus Scrofa	4230
—— Babyroussa	4316
Dicotyles torquatus	4490
Tapirus Indicus	4000
Elephas Indicus	2745
Rhinoceros Indicus	3765
Equus Caballus	4706
T...	13422
—— Asinus	4000
—— Burchellii	4360
—— Hemionus	4421
RUMINANTIA.	
Camelus Dromedarius... L.D.	3254
S.D.	5921
T...	15337
—— Bactrianus ..... L.D.	3123
S.D.	5876
T...	15210
Auchenia Vicugna ..... L.D.	3555
S.D.	6444
—— Paco ..... L.D.	3361
S.D.	6294
—— Glama	*ibid.*
Moschus Javanicus	12325
—— Stanleyanus	10825
Cervus Wapiti	4138
—— Hippelaphus	3777
—— Axis	5088
—— Dama	4515
—— Alces	3938
—— Barbarus	4800
—— Elaphus	4324
—— macrourus?	5074
—— Mexicanus	5175
—— Marhal	4978
—— porcinus	5391
—— Reevesii	6330
—— Capreolus	5184
—— Virginianus	5036
Camelopardalis Giraffa	4571
Antilope Cervicapra	5108
—— Dorcas	4922
T...	16000
—— Gnu	4800
—— Sing-Sing	5150
—— Philantomba	5116
—— picta	4875
—— Bubalis	5600
Capra Caucasica	7045
—— Hircus	6366

MAMMALIA—(*continued*).

Capra Hircus, var.	6430
Ovis Musmon	5045
—— Aries	5300
—— Tragelaphus	6355
Bos Taurus	4267
—— Taurus, var.	4571
—— Bison	4062
—— Bubalus	4586
T...	14000
—— Caffre	4703
—— frontalis	4299
—— Sylhetanus	4222
Rodentia.	
Pteromys nitidus	3777
—— volucella	3892
Sciurus vulgaris	4000
—— niger?	3841
—— maximus	3633
—— cinereus	4000
—— capistratus	3930
—— Palmarum	3847
—— Listeri	3948
Arctomys? pruinosus	3484
—— Empetra	3503
Dipus Ægyptius	4172
Mus giganteus	3892
—— decumanus	3911
—— Rattus	3754
—— musculus	3814
—— sylvaticus	3839
—— messorius	4268
—— Alexandrinus	3900
Arvicola amphibia	3790
—— riparia	4199
Ondatra Zibethica	3550
Hystrix cristata	3369
Erithizon dorsatum	3380
Synetheris prehensilis	3444
Capromys Fournieri	3483
Myopotamus Coypus	3355
T...	10667
Castor Fiber	3325
Cavia Cobaya	3538
Dasyprocta aurata	3857
—— Acouchi	3777
Cœlogenys subniger	3481
Hydrochærus Capybara	3190
Lepus cuniculus	3607
Lepus timidus	3560
Edentata.	
Bradypus didactylus	2865
Dasypus sex-cinctus	3457
—— villosus	3315
Marsupiata.	
Didelphis Virginiana	3557
T...	12000
Dasyurus viverrinus	4056
—— Maugei	4034
—— ursinus	3534
T...	10910
Perameles Lagotis	3902
Hypsiprymnus setosus	4000
Macropus Bennettii	3535
—— ocydromus	3442
—— Derbyanus?	3405
T...	10910
Halmaturus Billardieri	3623
Phalangista vulpina	3617
—— nana	3856
—— fuliginosa	3688
Petaurista sciureus	3661
Phascolomys Wombat	3456

AVES.

Rapaces.	L.D.	S.D.
Gypaëtus barbatus	1913	3425
Cathartes Iota	1880	3691
Sarcorhamphus Gryphus	1761	3892
—— Papa	1825	3600
Vultur auricularis	1835	3461
Nuclei...	4000	10666
—— fulvus	1829	3399
T. 9600		
—— Kolbii	1794	3337
—— leuconotus	1806	3425
—— Angolensis	1684	3166
Polyborus vulgaris	1829	3572
Buteo vulgaris	1852	3691
—— Lagopus	1852	3691
Aquila chrysaëtos	1812	3832
—— Bonelli	1866	3598
—— fucosa	1852	3485
—— choka	1830	3691
Helotarsus typicus	1891	3461
Haliaëtus albicilla	1829	3390
—— leucocephalus	1909	3390
—— Aguia	1806	3585
Falco Peregrinus	1916	3862
—— Tinnunculus	1891	3490

AVES—(*continued*).

	L.D.	S.D.
Falco subbuteo	1827	3507
Milvus vulgaris	1931	3677
Gypogeranus serpentarius	1722	3301
Surnia Nyctea	1555	4042
Nuclei	3200	10666
Otus brachyotus	1763	4076
Bubo maximus	1720	3566
Bubo Virginianus	1837	4000
Syrnium Aluco	1930	3801
Strix flammea	1882	3740
Nuclei	4000	10666
OMNIVORÆ.		
Cracticus hypoleucus	2116	4000
Barita Tibicen	2118	3892
Garrulus pileatus	2041	4167
—— glandarius	2064	3878
Nuclei	4000	10666
—— cristatus	2041	3512
Nucifraga Caryocatactes	1875	4172
Corvus corax	1961	4000
—— frugilegus	1894	3196
Nuclei	4572	9140
—— monedula	2243	4167
Nuclei	4000	10665
—— Pica	1953	3365
T. 11600		
Nuclei	4245	11138
Gracula religiosa	2075	4167
Fregilus graculus	2106	4505
Pastor roseus	2106	4630
—— cristatellus	2133	4050
—— tristis	1993	4167
Sturnus vulgaris	2115	3892
Nuclei	3764	11333
—— predatorius	2133	4175
Coracias garrula	2000	3478
Molothrus sericeus	2133	4567
Buceros Rhinoceros?	1690	3230
INSECTIVORES.		
Troglodytes Europæus	2359	4133
Regulus cristatus	2284	4133
Motacilla alba	2182	3600
Nuclei	4000	10666
Sylvia Phragmites	2003	3550
Philomela luscinia	1895	4400
Nuclei	4000	12000
Curruca atricapilla	2359	4133
Erythaca rubecula	2305	4133
Accentor modularis	2342	4000
Turdus viscivorus	2247	4000
—— musicus	2203	4133
—— migratorius	2348	4133
Turdus canorus	2305	3892
Merula vulgaris	2097	4256
Orpheus polyglottis	2223	3732
—— rufus	2231	3646
Muscicapa grisola	2179	4173
Lanius excubitor	1989	5325
Vanga destructor	2019	3892
GRANIVORÆ.		
Dolichonyx oryzivorus	2400	4167
Ploceus textor	2213	4575
Cardinalis Dominicana	2140	3643
—— cucullata	*ibid.*	*ibid.*
Amadina fasciata	2001	4364
—— punctularia	2133	4133
Pyrgita domestica	2140	3500
Nuclei	4364	9200
—— simplex	2273	4000
Fringilla Cœlebs	2253	4133
—— Chloris	2232	3600
—— amandava	2243	4800
—— cyanea	2144	3741
Linaria minor	2416	4848
Parus cæruleus	2313	4128
—— caudatus	2136	4570
Nuclei	4800	10666
—— major	2133	3892
Alauda arvensis	2125	4128
Nuclei	4000	12000
Emberiza citrinella	2286	4000
Nuclei	4000	12000
—— cristata	2310	4167
Plectrophanes nivalis	2133	4740
Loxia coccothraustes	2042	3790
T. 9141		
Nuclei	4570	10666
—— curvirostra	2365	4000
—— enucleator	2247	4083
—— Javensis	2286	3677
—— Astrild	2273	4740
—— cærulea	2290	3740
—— Malacca	2359	4167
Vidua paradisæa	1998	3740
Nuclei	3555	10666
ZYGODACTYLI.		
Corythaix Buffonii	1902	3764
Cuculus canorus	2028	3600
Plyctolophus Eos	1981	3728
—— sulphureus	2203	3399
—— rosaceus	1842	3547
Nuclei	4000	12000
—— galeritus	1880	3600
—— Philippinorum	1974	4041
Macrocercus Aracanga	1902	4041

AVES—(*continued*).

	L.D.	S.D.
Macrocercus Illigeri ...	1924	4335
—— Ararauna	1961	4128
—— Macao	1902	4762
—— severus	2165	3801
Platycercus Pennantii ...	2106	3931
—— Pacificus	2118	4174
—— eximius	2193	3892
—— flaviventris	2118	3892
—— Vasa	2045	3892
—— scapulatus	2000	4042
—— niger	2133	3892
NymphicusNovæ-Hollandiæ	2160	4174
Psittacara leptorhyncha .	2067	3931
—— murina	2133	4031
—— Patachonica	2115	3977
—— viridissima	2029	4190
—— solstitialis	2133	4000
—— virescens	2097	4175
Trichoglossus capistratus	2203	3892
Palæornis Alexandri ...	2115	3892
—— torquatus	2174	3892
—— Bengalensis	2278	4000
Lorius domicellus	2093	4133
—— Ceramensis	2115	4000
—— Amboinensis	2045	4133
—— coccineus	2165	4000
—— Sinensis	2115	3692
Tanygnathus macrorhynchus	2106	3829
Psittacus erythacus	1898	4000
—— albifrons	1931	3692
—— Augustus	2085	3600
—— Americanus	2115	3600
—— Regulus	2037	3764
—— Dufresnii	2278	3374
—— Amazonicus	1800	3832
—— leucocephalus	2050	3727
—— badiceps	2165	3617
—— menstruus	2115	3708
—— melanocephalus ...	2005	3892
—— mitratus	2029	3892
Psittacula cana	2101	4174
—— pullaria	2097	4174
Picus minor	2170	3892
Anisodactyli.		
Sitta Europæa	2213	4188
Nuclei ...	4572	11000
Certhia familiaris	2305	4000
Alcyones.		
Dacelo gigantea	2110	3555
Alcedo Ispida	2124	3693

	L.D.	S.D.
Cheliones.		
Hirundo rustica	2133	4000
—— urbica...	2170	4000
Cypselus Apus	1982	3850
Nuclei ...	4000	10666
Columbæ.		
Columba Palumbus	1973	3643
—— risoria	2133	3523
—— Turtur.....	2005	3369
—— tigrina	2088	3615
—— rufina	2314	3429
—— chalcoptera	2208	4062
—— Nicobarica	2133	3692
—— Guinea	2165	3839
—— Corensis	2193	3643
—— aurita	2422	3519
—— montana	2239	3692
Nuclei ...	5333	12000
—— Zenaida	2203	3571
—— migratoria	1909	4626
—— coronata	1954	3491
—— leucocephala	2132	3646
—— mysticea	2100	3512
Gallinæ.		
Penelope leucolophos ...	1902	3607
Nuclei ...	3555	9166
—— cristata	*ibid.*	*ibid.*
Crax globicera	1985	3425
—— rubra	1993	3664
—— Yarrellii	2000	3456
Ourax Mitu	2005	3490
Pavo cristatus	1835	3589
—— muticus	*ibid.*	*ibid.*
—— Javanicus	1884	3491
Phasianus pictus	2213	3615
—— nycthemerus	1887	3470
Nuclei ...	4000	8000
—— superbus	2128	3587
—— lineatus	1855	3348
Nuclei ...	4570	9166
—— Colchicus	2168	3646
Nuclei ...	5647	7111
Gallus domesticus	2102	3466
Nuclei ...	6000	9140
Meleagris gallapavo ...	2045	3598
Numida Rendallii	2054	4415
Francolinus vulgaris ...	2106	4041
Perdix longirostris	2054	3801
—— Bonhami	1933	3282
Nuclei ...	4570	10666
Coturnix Argoondah ...	2347	3470
Ortyx Virginianus	2213	4000
—— neoxyenus	2305	3836

AVES—(*continued*).

	L.D.	S.D.
Tetrao urogallus	2248	3836
—— Tetrix	2376	3728
—— Caucasica	1923	3456
Nuclei	4570	9166
Tinamus rufescens	1752	3338
Alectorides.		
Dicholophus cristatus	1884	3364
Cursores.		
Struthio Camelus	1649	3000
T. 9166		
Nuclei	3200	9166
Dromaius Novæ-Hollandiæ	1690	3031
Rhea Americana	1898	3273
Grallatores.		
Œdicnemus crepitans	2157	4000
Vanellus cristatus	1964	3310
Hæmatopus Ostralegus	1895	4000
Nuclei	3200	9000
Psophia crepitans	1883	3488
Anthropoides Virgo	1884	3740
T. 11230		
—— Stanleyanus	1909	3529
Balearica pavonina	1859	3777
T. 9597		
Nuclei	4000	9750
—— Regulorum	1858	3478
Ardea cinerea	1913	3491
—— Nycticorax	1780	3555
—— minuta	1993	3827
Platalea leucorodia	1859	3600
Ciconia alba	1755	3439
—— nigra	1806	3403
Ciconia Argala	1728	3555
—— Marabou	1859	3460
Ibis ruber	1948	3153
Numenius Phæopus	1846	4465
Limosa melanura	1973	3764
Scolopax Gallinago	2170	3622
Rallus Philippinensis	2997	3589
Gallinula chloropus	2055	3839
Pinnatipedes.		
Podiceps minor	2001	3200
Palmipedes.		
Plectropterus Gambiensis	1866	3728
Chenalopex Ægyptiaca	1866	3839
Cereopsis Novæ-Hollandiæ	1722	3692
Bernicla Sandvicensis	1866	3839
—— Magellanica	*ibid.*	*ibid.*
Cygnus atratus	1806	3692
Dendrocygna viduata	1789	3555
—— autumnalis	1916	3764
—— arborea	1931	3724
Dendronessa sponsa	2001	4079
Tadorna vulpanser	1925	3839
Mareca Penelope	1873	4385
Querquedula crecca	2062	4592
—— acuta	1993	3839
—— circia	2088	3839
Anas galericulata	1937	3424
Larus ridibundus	2097	4000
—— canus	1973	3839
Nuclei	3555	10666
Pelecanus Onocrotalus	1777	3369
Nuclei	3200	9600
Phalacrocorax Carbo	2005	3765

REPTILIA.

	L.D.	S.D.
Chelonia Mydas	1231	1882
Nuclei	4000	6000
Testudo Græca	1252	2216
—— radiata	1241	2197
Alligator ——?	1324	2122
Crocodilus acutus	1231	2286
T. 8000		
—— Lucius?	1124	2215
Champsa fissipes	1259	2315
Iguana Cyclura	1230	2285
Nuclei	5333	6400
Lacerta viridis	1555	2743
Anguis fragilis	1178	2666
Natrix torquata	1371	2157
T. 8341		
Nuclei	3835	6817
Coluber Berus	1274	1800
Nuclei	3227	4986
Python Tigris	1440	2400
Nuclei	3555	7468

AMPHIBIA.

	L.D.	S.D.		L.D.	S.D.
Rana temporaria	1108	1821	Triton Bibronii	848	1311
T. 7112			Nuclei ...	1901	3000
Nuclei ...	3114	6297	—— cristatus	*ibid.*	*ibid.*
Bufo vulgaris	1043	2000	Lissotriton punctatus ...	814	1246
T. 5625			Nuclei ...	1778	2667
Nuclei ...	2802	5261	Siren lacertina	435	800
			Nuclei ...	1142	2007

PISCES.

	L.D.	S.D.		L.D.	S.D.
Perca fluviatilis	2099	2824	Cyprinus auratus	1777	2824
T. 8000			T. 10666		
Nuclei ...	7482	8830	Nuclei ...	4570	8000
—— Cernua	2461	3000	—— Erythrophthalmus.	2000	3200
Nuclei ...	6000	8000	—— Phoxinus	2000	2900
Cottus Gobio	2000	2900	Esox Lucius	2000	3555
T. 8000			Nuclei ...	5333	8000
Cyprinus Carpio	2142	3429	Anguilla vulgaris	1745	2842
T. 8000			T. 8000		
Nuclei ...	6400	8000	Nuclei ...	7500	10000
—— Tinca	2286	2722	Gymnotus electricus ...	1745	2599
T. 8830					
Nuclei ...	8500	9600			

MISCELLANEOUS.

MILDNESS OF THE SEASON.

Two instances of the mildness of the season have occurred. A pair of the *Vanessa Io* were brought to me, caught flying at Bardsey, near Leeds, on the 24th January. A *robin's* nest, with *young ones*, was found near Swillington, about six miles from Leeds, on the 2nd February. HENRY DENNY.

DE HIRUNDINUM AD NOS REDITU.

Salve, quæ ad nos incolumis te vertis, hirundo,
Quandoquidem veris nuncia grata redis;
Et nos ceu socios post frigora sæva revisis,
Et tecum nobis tempora læta refers.
Te redeunte redit facies lætissima mundo.
Sævus abit Boreas; mitior aura redit.
Solvunturque nives, et grato murmure rivi
Labuntur ripis, prataque amœna rigant.
Herba solum vestit, pinguntur floribus arva,
Omnis abit squallor, pulchra juventa redit.
Te redeunte, virent nuper quæcunque rigebant,
Arboribus redeunt te redeunte comæ.
Salve, igitur, felix cunctis mortalibus ales,
Nuncia veris avis, nuncia lætitiæ.

Lucas Nicolaus del Muto.

AGRIMONIA ODORATA, AITON.

In the course of an examination of my native species of *Rosaceæ*, I have had the fortune to detect a good specimen, in fruit, of the *Agrimonia odorata* of the Hortus Kewensis, given to me by the Rev. W. W. Newbould, who gathered it at Beaumont in the island of Jersey on the 15th of August 1842. I believe this to be the only continental plant, not known as a native of Britain, which has been added to the flora of the Channel Islands since the publication of the 'Primitiæ Floræ Sarnicæ.' It is distinguished from *A. Eupatoria*, which it greatly resembles, by its "greater size,—three to four feet high;" leaves more deeply and more sharply cut, hairy and furnished with scattered glands beneath, not cano-tomentose; tube of the calyx of the fruit larger but shorter, bell-shaped or nearly hemispherical, not turbinate, uniformly hairy and glandular, only furrowed in its upper half, and even there the furrows are shallow; spines longer, and the lower ones strongly reflexed; petals "saturate aureis," red in the dried specimen. It will probably be detected in some of our southern counties if diligently looked for.—C. C. B.

HASSALL'S "BRITISH FRESHWATER ALGÆ."

The Editors think it right to make a few observations upon Mr. Hassall's letter printed in the last number of these 'Annals,' and to which these remarks would have been appended, had they not thought that they might as well allow their readers one month's opportunity of contrasting the letter and the review, believing that the latter is by far the best answer to most points brought forward in the former. They wish it to be distinctly understood that they are not again reviewing the work, and do not intend to be drawn into a paper war, which would be totally out of place here.

Mr. Hassall complains that the review contains animadversions which a careful and candid examination of the work will not justify; they have now to state that a re-examination has only convinced them that the reviewer has been very lenient, and that Mr. Hassall should have been well-satisfied when he reflects how plentifully he has appropriated to himself the labours of others.

Suppose that Mr. Hassall had been engaged for the last two or three years in bringing out periodically original and elaborate figures with descriptions, as Mr. Ralfs has done, and that some compiler, watching close at his heels, had instantly and without ceremony copied a very large number of his figures, and given them to the world as his own, would Mr. Hassall have been content to acquiesce without complaint or remonstrance? To say nothing of the illegality of such a proceeding (which however is clear enough), there is too much reason to complain of its injustice and disingenuousness.

It is to little purpose that Mr. Hassall states that "no one *plate* is a copy of any one of Mr. Ralfs's," when the *figures* of which they are composed are palpably so, although by transpositions and inversions the identity of the plates is disguised.

Our readers may judge for themselves by comparing the plates of *Desmideæ* in both works: they will see that there is not a single

figure in Mr. Hassall's Plates lxxxv. or lxxxvi. that is not taken from the Annals.

Mr. Hassall alleges that he has made a *sufficient* acknowledgement in having stated in his work that "several of the figures of this family, especially *certain* of the genera *Euastrum* and *Cosmarium*, are taken from those of Jenner and Ralfs." Now, with regard to *Cosmarium*, all the figures, thirty-four in number, are copied from the 'Annals,' while in *Goniocystis*, including *Arthrodesmus*, there are fifty-one figures, all copies, without a single original.

Neither space nor inclination allows the detail of further instances, but an examination of the work has confirmed the editors in the conviction that Mr. Hassall has by no means made a full and fair avowal of the extent of his obligations to others.

The opinion expressed in the review upon comparative specific characters is confidently left to the judgement of naturalists.

Mr. Hassall's statement that "it would have been easy for him, had he thought proper to do so, to have abstained from quoting Mr. Ralfs altogether," when he had helped himself so freely to his figures, needs no comment.

It may be right to state that Mr. Jenner's labours were not coupled with those of Mr. Ralfs in the review, owing to his not having *published* upon these tribes. Mr. Jenner's researches are well-known to and most highly appreciated by the reviewer. Mr. Jenner would be the last to take credit to himself for the labours of another, as may be seen in his 'Flora of Tunbridge,' pp. 178, 188, 192, 200.

HASSALL'S "BRITISH FRESHWATER ALGÆ."

To the Editors of the Annals of Natural History.

GENTLEMEN,—In Mr. Hassall's letter in your February number, in answer to your reviewer of his 'British Freshwater Algæ,' my name is used, in the allusions to Mr. Ralfs's papers on the *Desmidieæ*, in such a manner as I am afraid might mislead the public; I am induced, therefore, to beg the insertion of a few lines in your next number.

Those papers were written solely by Mr. Ralfs, and I must disclaim any praise at his expense; since my having assisted him in his observations, or given the outlines of some of the figures, could not make me the author.

No one has been more ready, nor more careful to give another credit for what was due to him than Mr. Ralfs has been; but what little I have done has been for my own amusement, and from love of natural history. It has afforded me the greatest pleasure, as well as instruction, to have a person so faithful in investigation, so acute and accurate in observation, and so perspicuous, simple and concise in definition to correspond with, and I am pleased with the opportunity now afforded me to state that at first, most of my knowledge of this interesting, curious and very beautiful tribe of plants was obtained through his kindness, and also that it is my intention to render Mr. Ralfs every assistance in my power in bringing out his

'Monograph of the British *Desmidieæ*,' either in microscopical observation, by faithful outlines, or in the determination of any difficult point.

Mr. Hassall also is a gentleman whom I respect, and for most of my knowledge of the British *Conjugatæ* I am indebted to his kindness. I am, Gentlemen, your obedient servant,

EDWARD JENNER.

On the Disease of the Plantain. By GEORGE R. BONYUN, M.D. Communicated by W. H. Campbell, Esq., LL.D., Secretary of the Royal Agricultural and Commercial Society of British Guiana.

The varieties of the edible plantain, which are known and cultivated throughout the West Indies, Africa and the East, are all of them reducible to two species, viz. the plantain and the banana (*Musa paradisiaca* and *Musa sapientum*). The difference between these two plants is even so slight as to be scarcely specific; it is therefore most probable that there was originally but one stock, from which they have by cultivation and change of locality been derived. It is therefore necessary to determine with exactness, if possible, whether the plantain or banana (whichever be the parent stock) exists anywhere at present, or has been known to have existed as a perfect plant, that is, bearing fertile seeds, or whether it has always been in the imperfect state, that is, incapable of being procreated by seed, the only state in which it exists in this colony.

In the oldest botanical descriptions of the plantain, bakova, pisang, banana, bihai, or by whatever name it is known, it is invariably described as an anomalous plant not perfecting its seeds; nor is there any traveller who has described a plant which could be considered to be the plantain in its uncultivated state.

In Gerard's 'Herbal,' printed in 1636, p. 1464, there is an excellent drawing of a bunch of plantains, and it is described as seedless. Plumier, in his 'Nova Plantarum Americanarum Genera,' printed in 1703, gives a like description of the plantain. Linnæus, in his 'Species Plantarum,' anno 1763, describes four species, *Musa paradisiaca*, *sapientum*, *Bihai* and *Troglodytarum*, which latter, on the authority of Rumphius, he says, bears many seeds (*hæc gerit semina multa*). He supposes the two former to be hybrids produced by impregnating the Bihai with some congeners unknown to him. Since Linnæus's time the "Bihai" has been found to belong to a different genus than *Musa*; it is now called *Heliconia humilis*, is a native of South America, and produces fertile seeds. Whether Linnæus be right in his conjecture that the Bihai is the stock-plant of the plantain, it is almost impossible to ascertain; but the absence of any description of a wild seed-bearing plantain renders it highly probable that the cultivated species are hybrids produced long ago. The banana, from time immemorial, has been the food of the philosophers and sages of the East; and almost all travellers throughout the tropics have described these plants exactly as they are known to us, either as a sweet fruit eaten raw, or a farinaceous vegetable roasted or boiled.

It is remarkable that the plantain and banana should be indigenous, or at all events have been cultivated for ages both in the old and new world. Numerous South American travellers describe some one of these plants as being indigenous articles of food among the natives, thus showing (if the plantain and its variety be hybrids) a communication between the tropics of America, Asia and Africa long before the time of Columbus. The older writers on this colony consider the plantain to be a native. Thus Hartsinck in his 'History of Guiana,' vol. i. p. 71, describes under the head of "description of wild trees" the fruit of the plantain or wild banana tree as being eaten by the Indians roasted or ripe, &c., while the banana is under the description of cultivated trees. Belin, 'Description Géographique de la Guyane,' p. 49, in like manner describes the plantaine, or plantin, as being a food used by the Indians, &c. It is remarkable that Sir Robert Schomburgk likewise found a large species of edible plantain far in the interior. It appears to me to be quite clear therefore that the plantain is either a hybrid, or its power of procreation by seed has been destroyed long ago by cultivation, and that it is not known to exist anywhere in a perfect state; in either of which cases, any attempt to improve *our present stock* by the introduction of suckers from elsewhere must be totally futile. I need scarcely remark, that should the suppositions with regard to the hybridity of the plantain be incorrect, and that in certain localities to us at present unknown the plant matures its seed, the seedlings would require long cultivation by repeated transplantation of suckers to deprive the fruit of its seed, or in other words, to render it edible.

If the proposed introduction of plantain suckers from Matanzas, Porto Rico, or other countries, be with the view of entirely substituting them for our present stock, and thus getting rid of the disease, a very serious matter for consideration is presented to us, viz. Is the disease hereditary or owing to imperfection in the plant itself, or is it caused by unfit soil or imperfect tillage? If it be hereditary, then the only means left is totally to eradicate the present stock and to introduce a new one. If, on the other hand, the disease be one of locality, then the introduction of new plants would be merely exposing them to the same cause of destruction. The cause of the disease has been considered by some to be a species of beetle, which destroys the root or finds its way into the body of the tree. This however is a conjecture totally unsupported by any facts, the minutest investigation not disclosing the existence of any such animals in the diseased plantain tree, or at least in that relation to the tree which would in any way justify the supposition that they were the cause of the disease. Another supposition has been that the disease is similar to the smut in wheat, but is equally as unfounded as the beetle theory, no fungi being discovered in the diseased parts, even by the aid of a very powerful achromatic microscope.

Dr. Aanzorg's theory is, that there is a deficiency of certain chemical substances in the soil, and his experiments appear to render his supposition very probable. On the other hand, several planters declare that the youngest suckers from a diseased stock grow up for

the most part diseased, wherever planted. These conflicting opinions must be cleared up by experiment. In the meantime, I believe that I can point out the "seat of the disease," which is at all events the first step towards the discovery of its cure. If a plantain tree be stripped of its leaves from the root upwards, it will be found to consist of a number of joints—the bunch of plantains being a continuation of the upper joint, and the spire being the upper leaf rolled up —exactly similar to a cane and its arrow—the bunch being the organic apex of the plantain tree, in the same manner as the cane arrow is the organic apex of the cane plant.

Of the various vessels and tissues which are necessary to vegetable life, the plantain tribe abounds in what are called spiral vessels or tracheæ; and if a healthy plantain tree be examined from the root upwards as far as the fruit, these vessels will be found in continuous lines; and even in the farina of the plantain they are detected in an extreme state of tenuity. On further examination, these spirals (as has been known to botanists for some time) are found to be composed of numerous fasciculi, and are contained in tubes from whence they can be drawn forth, having a translucid appearance, and being perfectly free from any adherent matter. From the large number of these vessels in the plantain tribe, it is evident that their functions must be important, and that any impediment to their healthy action must be attended with an imperfect development in some part of the plant. Now if a plantain tree bearing a bunch of plantains in a more or less diseased state be examined carefully, a certain number of these tubes containing spirals from the roots up, through the culm or body of the tree into the bunch, will be found to be filled with a ferruginous-looking fluid of a more or less dark colour, and if the spiral vessels be drawn forth from their tubes, this matter will be seen to collect upon them in minute drops; the spirals will also be of the same colour as the substance contained in the tubes. A bunch of plantains in the extreme state of disease, containing no farina, but merely the dissepiments of the cells, will have a large number of the spiral tubes, particularly in the circumference of the culm, filled with a dark ochreous-coloured fluid, while the number of diseased tubes will be fewer, and the colour of the fluid contained more of a yellowish colour, in less diseased plants.

In the stock of a small poor bunch of plantains, but still containing farina and edible, only a trace here and there of the abnormal matter was found. This peculiar state is not confined to the full-grown plant, but the youngest suckers show the disease in a greater or less degree. All the other tissues and vessels of diseased trees I have found after the most careful investigation to be quite sound. The decay of the leaves, and subsequent rottenness and destruction of the plant, is owing to its diminishing vitality, and has nothing to do with the specific disease. Any mechanical injury sufficiently violent to diminish the vigour of the plant, would be followed by similar decay and rottenness. I am therefore fully convinced, that, whatever may be the cause of the disease, the seat of it is in the tubes containing the spiral vessels, which are invaded by an abnormal

fluid, which is inimical to the formation of the pulp in the fruit, or impedes the spirals in the due performance of their functions. The chemical composition of this fluid, and whether it be absorbed directly from the soil, or eliminated within the plant in consequence of functional disease of its organs, will form the subject of future investigation; and I would venture to augur, the colony having now the assistance of a gentleman of high scientific acquirements, that not only the cause, but the cure of this very destructive disease will be shortly discovered.

METEOROLOGICAL OBSERVATIONS FOR JAN. 1846.

Chiswick.—January 1. Fine. 2, 3. Frosty: fine: overcast. 4. Rain. 5. Sharp frost: cloudy: clear and frosty. 6. Drizzly. 7. Overcast and mild throughout the day and night. 8. Cloudy and fine. 9. Uniformly overcast. 10. Overcast: drizzly rain. 11. Hazy and drizzly. 12. Cold haze. 13. Hazy: very fine. 14. Foggy: overcast and fine. 15. Fine. 16. Thick fog: rain at night. 17. Hazy: drizzly: cloudy and mild. 18. Foggy: rain at night. 19. Constant rain: boisterous, with rain at night. 20. Clear and fine. 21. Rain: densely clouded and mild: boisterous, with rain at night. 22. Boisterous, with rain: densely clouded. 23. Heavy showers. 24. Hazy and mild. 25. Rain. 26. Showery: heavy rain at night. 27. Clear: cloudy: rain at night. 28. Rain: cloudy: very high tide in the Thames: clear. 29. Rain. 30. Overcast. 31. Cloudy: windy at night.

Mean temperature of the month	43°·54
Mean temperature of January 1845	38 ·69
Average mean temperature of Jan. for the last twenty years	36 ·46
Average amount of rain for the last twenty years	1 ·60 inch.

Boston.—Jan. 1. Stormy: rain last night. 2. Fine. 3. Cloudy. 4. Rain. 5. Fine. 6. Rain. 7. Cloudy. 8. Fine. 9—13. Cloudy. 14, 15. Fine. 16. Foggy. 17. Cloudy: rain A.M. and P.M. 18. Foggy. 19. Rain: rain early A.M.: rain P.M. 20. Windy: rain early A.M. 21. Cloudy: rain P.M. 22. Cloudy and stormy: rain early A.M. 23. Fine. 24. Cloudy: rain early A.M. 25. Fine: rain early A.M. 26. Cloudy: rain early A.M. 27. Fine. 28, 29. Rain. 30, 31. Cloudy.—N.B. Not so warm a January since January 1834: the average of that month was 44°·3.

Sandwick Manse, Orkney.—Jan. 1. Snow-showers. 2. Fine: frost: cloudy. 3. Cloudy: clear. 4. Clear: showers. 5. Bright: showers. 6. Damp: clear. 7. Cloudy: showers. 8. Showers: clear. 9. Cloudy: clear. 10. Rain: cloudy. 11. Drizzle: damp. 12. Drizzle: hazy. 13. Bright: cloudy. 14. Damp: cloudy. 15. Rain: drizzle. 16. Clear. 17. Damp. 18. Bright: cloudy. 19. Damp: showers. 20. Rain: drizzle. 21. Rain: clear. 22. Damp: rain. 23. Fine: damp. 24. Fine: frost: damp: aurora. 25. Rain: cloudy. 26. Damp. 27. Damp: rain: clear. 28. Cloudy: showers. 29. Showers. 30. Cloudy: rain. 31. Drizzle: showers.

Applegarth Manse, Dumfries-shire.—Jan. 1. Snow-showers. 2. Frost: clear and fine. 3. Wet all day. 4. Fine A.M.: shower P.M. 5. Frost A.M.: rain P.M. 6, 7. Showery. 8. Fair. 9, 10. Slight drizzle. 11. Slight drizzle: fog. 12. Fair and mild. 13. Fair A.M.: rain P.M. 14. Fair: one slight shower. 15. Wet A.M.: cleared: fine. 16. Frost, slight: fine. 17. Fair A.M.: slight shower P.M. 18. Fair, but cloudy. 19. Rain nearly all day. 20. Rain all day: flood. 21. Fair, but cloudy. 22. Drizzling rain. 23. Rain and fog. 24. Thick fog. 25. Heavy rain: flood. 26. Drizzling rain. 27. Rain A.M.: fair: rain P.M. 28—31. Rain.

Mean temperature of the month	43°·0
Mean temperature of January 1845	36 ·1
Mean temperature of Jan. for twenty-three years	34 ·3
Mean rain in January for eighteen years	2 ·57 inches.

Meteorological Observations made by Mr. Thompson *at the Garden of the Horticultural Society at* CHISWICK, *near London; by* Mr. Veall, *at* BOSTON; *by the* Rev. W. Dunbar, *at Applegarth Manse,* DUMFRIES-SHIRE; *and by the* Rev. C. Clouston, *at Sandwick Manse,* ORKNEY.

Days of Month.	Barometer.							Thermometer.							Wind.				Rain.			
	Chiswick.		Boston. 8½ a.m.	Dumfries-shire.		Orkney, Sandwick.		Chiswick.		Boston. 8½ a.m.	Dumfries-shire.		Orkney, Sandwick.		Chiswick. 1 p.m.	Boston.	Dumfries-shire.	Orkney, Sandwick.	Chiswick.	Boston.	Dumfries-shire.	Orkney, Sandwick.
1846. Jan.	Max.	Min.		9 a.m.	9 p.m.	9½ a.m.	8½ p.m.	Max.	Min.		Max.	Min.	9½ a.m.	8½ p.m.								
1.	30·051	29·692	29·23	29·51	29·80	29·38	29·77	46	30	42·5	45½	37	36½	36½	nw.	w.	w.	n.	.....	·31	.....	·40
2.	30·475	30·192	29·85	30·12	30·23	30·18	30·16	41	22	34	37	30	32	37	n.	calm	n.	s.	.....	.....	.....	·06
3.	30·440	30·335	30·10	30·10	29·83	29·92	29·62	43	38	34	45½	33	41	45	s.	calm	s.	s.	·06	.....	.....	·16
☽ 4.	30·008	29·828	29·60	29·61	29·84	29·52	29·70	43	22	38·5	45½	37	40½	40	sw.	w.	sw.	w.	·04	·09	.....	.....
5.	30·134	30·085	29·75	29·95	29·85	29·92	29·67	39	21	32	39½	31	39	40	sw.	calm	ssw.	sse.	.....	·16	.....	·19
6.	30·060	29·998	29·70	29·70	29·74	29·58	29·51	47	44	36	49	30½	45	49½	sw.	w.	sw.	wsw.	·02	·04	.....	·08
7.	30·327	30·203	29·75	29·88	30·00	29·55	29·69	48	43	45	49½	45	50	49	w.	w.	sw.	ssw.	.....	·03	0·40	·07
8.	30·576	30·451	30·03	30·15	30·31	30·02	30·19	50	41	43	50	46	46	45	sw.	calm	sw.	wsw.	.....	.....	.....	·19
9.	30·621	30·529	30·21	30·39	30·30	30·26	30·06	49	47	40·5	49	43	46	45½	sw.	calm	ssw.	ne.	.....	.....	.....	·04
10.	30·477	30·374	30·10	30·18	30·14	29·92	30·13	42	37	40	48	42½	46	43	sw.	calm	sw.	nw.	·01	.....	.....	.....
11.	30·317	30·237	29·92	30·13	30·04	30·16	29·96	42	32	43	48	35	41	43	sw.	calm	sw.	sse.	·01	.....	.....	·19
○ 12.	30·067	29·846	29·71	29·83	29·60	29·80	29·69	36	31	37	43½	38½	45	43	se.	calm	se.	se.	.....	.....	.....	·04
13.	29·654	29·491	29·39	29·47	29·30	29·56	29·50	48	35	35	45	33½	40	45	se.	calm	ese.	se.	.....	.....	.....	·05
14.	29·524	29·429	29·21	29·28	29·36	29·42	29·52	50	37	39	48	39	46	40	se.	calm	se.	se.	.....	.....	0·21	.....
15.	29·866	29·729	29·39	29·39	29·67	29·46	29·63	49	36	43	48	42	43	46	s.	calm	s.	sw.	.....	.....	.....	·02
16.	29·838	29·722	29·53	29·69	29·58	29·74	29·75	51	40	39	47	34	40	40	e.	calm	s.	se.	·04	.....	.....	·37
17.	29·726	29·658	29·38	29·57	29·58	29·80	29·85	51	36	42	46½	41½	43	42	sw.	calm	e.	se.	·01	.....	.....	.....
18.	29·734	29·604	29·37	29·55	29·47	29·81	29·68	53	35	39	47	40	40½	39	sw.	calm	e.	ese.	·24	·12	.....	.....
19.	29·194	28·943	28·95	29·10	28·70	29·42	29·17	54	41	43	46½	37	41	42	sw.	s.	e.	e.	·44	·04	.....	·05
☾ 20.	29·484	29·309	28·78	28·71	29·05	28·98	29·01	51	40	45	48½	43	42	41½	sw.	w.	w.	e.	·14	·56	.....	·34
21.	29·313	29·145	29·00	29·12	28·90	29·06	29·06	55	50	45	46	39	43	36	sw.	calm	sw.	se.	·33	.....	1·18	·17
22.	29·228	29·053	28·52	28·60	28·90	28·97	28·97	56	41	52	47	42½	40½	41½	sw.	w.	sw.	se.	·02	·45	.....	.....
23.	29·223	29·154	28·84	28·95	28·99	29·00	29·12	51	42	43	47	42½	40½	39	sw.	calm	s.	.....	·27	.....	.....	·20
24.	29·644	29·330	28·98	29·24	29·30	29·35	29·38	53	41	45	47	39	38	37½	sw.	calm	s.	ese.	·24	·07	.....	·01
25.	29·339	29·143	28·85	28·94	28·90	28·96	28·95	56	46	50·5	49	42	43	43	sw.	calm	sw.	se.	·59	·27	.....	·47
26.	29·242	29·168	28·73	28·86	28·89	28·95	28·94	55	41	48	49	45½	45	44½	w.	calm	s.	se.	·08	·03	.....	·20
● 27.	29·624	29·359	28·98	29·07	29·29	28·98	29·22	54	40	43	50½	44	45	44½	sw.	calm	sw.	ssw.	·02	.....	.....	·04
28.	29·584	29·394	29·02	29·05	29·11	29·04	29·00	56	39	45	49½	43	44	42	w.	calm	sw.	se.	·06	·01	.....	·10
29.	29·780	29·344	29·13	29·10	29·40	28·90	29·26	54	37	44	50	43½	44	45½	sw.	w.	sw.	sw.	·23	·15	.....	·20
30.	29·919	29·863	29·48	29·55	29·60	29·35	29·28	53	40	42	51	42½	43½	46	sw.	calm	wsw.	w.	.....	·17	1·45	·13
31.	29·965	29·804	29·45	29·52	29·28	29·15	29·19	55	44	51	51½	46	47	42	sw.	calm	sw.	w.	.....	.....	.....	·61
Mean.	29·852	29·690	29·38	29·494	29·514	29·487	29·504	49·38	37·71	41·9	47·2	39·3	42·48	42·37					2·85	2·50	3·24	4·38

THE ANNALS

AND

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XXX.—*Observations on the Tribe* Sphæriaceæ, *and descriptions of certain new Genera.* By Prof. Giuseppe de Notaris. Florence*, 1844. 4to.

By means of the immortal works of Bulliard, Persoon, Fries, Kunze, Nees, Greville and others, mycology has made of late years surprising progress, although it still continues in some of its parts very inferior to the other branches of cryptogamic botany. This arises, if I mistake not, from an opinion unfortunately adopted by certain writers of authority, who have not hesitated to assert, that microscopic observations instead of conducing to happy results are prejudicial to the study of mycology, and are the perpetual fountain of error and confusion. This opinion I not only hold to be false, but even incompatible with the present exigences of the human mind, which cannot content itself with the superficial exterior of things, but delights in searching into their most secret recesses.

And what, in truth, was the study of Cryptogamia before the compound microscope, thanks to the pains taken by the enlightened Amici, was brought to its present degree of perfection? The microscope has unveiled to us, not to speak of the surprising discoveries in bryology, lichenology and algology, the various ways in which fungi are reproduced, which, whether from the singularity of their forms, their hidden mode of growth, or the excessive minuteness of their parts, were the subject of very insufficient observations. How mycology has advanced since the late improvement in microscopic observations, the works of Vittadini, Corda, Montagne and Berkeley bear incontestable evidence.

No one is ignorant that Persoon and Fries made the study accessible by defining the limits of the families, properly describing the species, and laying the foundation of the natural system;

* Translated from the Italian. Communicated by the Rev. M. J. Berkeley. This memoir, which was first published as a separate pamphlet in 4to, has since appeared in 'Giornale Bot. Italiano,' edited by Parlatore.

but from having too often preferred characters more ready of access to those of internal structure, and trivial differences to the organs of fructification, they led students astray from the analytic method formerly adopted by the immortal Micheli, who, assisted by the power of their own minds, would otherwise have guided them by a surer and more noble path. The works of Micheli were often consulted, but his observations were either carelessly passed over or considered incomprehensible, and we have seen several of our contemporaries advance facts as new which had already been published in the 'Nova Plantarum Genera.'

Of all the divisions of the mycological kingdom, that of the *Pyrenomycetes* or *Hypoxyla* especially appears to me most strikingly to prove what I have above asserted. Analyse the works of Persoon, Fries, Duby, Wallroth and Chevalier, and you will find the form and colours of the perithecia, the way in which they open, the mode in which they burst from the matrix, the stroma, the colour, the consistence of the nucleus, accurately described; but of the parts of which the nucleus itself is composed, of the parts in which the essential and classical characters really reside, of the fructification, of the internal structure of the conceptacula, there is no intimation whatever, or they give them joined to the others as of secondary importance and out of mere compliment.

Thus it is that in this family myriads of errors and contradictions are met with at every step. We find, for example, some species of *Sphæria* placed among the *Cytisporæ*, because the nucleus bursts from the perithecium in the form of a tendril; to *Lophium* we find pulverulent sporidia assigned, because they are thread-shaped and equal in length to the asci. Among the *Sphæriæ* we find species which have the nucleus composed of sporidia only—species which belong to *Sphæronema*, and in short true *Peziæ*, because in colour, form, and mode of growth they present the semblance of a perithecium.

Among the general characters of Fries' sections of the immense genus *Sphæria*, based principally and sometimes with useless details on the existence or want of a stroma, or on the mode in which the perithecia are disposed, we certainly find the asci and sporidia mentioned, but the sporidia in the same sections differ immensely in the several species in form, structure or size. We find allied species dispersed in different sections or even identical species, solely from their having attacked vegetables of different families or parts of different duration.

I do not hesitate to assert this, having had the advantage of procuring an authentic copy of the entire collection of the *Scleromycetes Suecici* of Fries, possessing also the greater part of the types published in the 'Fasciculi' of the enlightened Prof. Kunze, those illustrated by Montagne in his 'Notice sur les Plantes

Cryptogames récemment découvertes en France,' and in the third edition of the 'Flore des environs de Paris' of Merat, and the collections of Demazières and others, with the help of which I have been able to make a multitude of comparisons and clear away no slight number of errors;—errors which, without further preface, appear to me incontestably to demonstrate—

1st. That the progress in cryptogamic botany is chiefly owing to microscopical observations.

2ndly. That the classification of the *Pyrenomycetes* especially can never be natural nor philosophical, until we know the most minute particulars of the fructification of the species.

Besides which, if in the classification of many other tribes of fungi, and in defining the genera and species of the *Perisporiacei, Myxogastres, Mucorini, Coniomycetes,* &c., part of the characters are furnished by the peridia and sporidia, why should such characters be altogether rejected in the *Pyrenomycetes,* in which these organs are more complicated, and consequently rank higher in the series of organized structure?

The suspicion that differences in the fructifying parts of the genus *Sphæria* might be found, had arisen in my mind from the first moment in which I prepared myself to examine analytically a few minute fungi, which I afterwards described and figured in my decades of *Micromycetes.* During last winter, however, having previously excluded those species in which I had not succeeded in finding a *nucleus ascigerus,* I prepared with the utmost diligence of which I was capable, the analysis, descriptions and figures of 200 other *Sphæriæ*; and I assert that in identical species, from whatever different region they came, and these often growing on plants of different families, I have always found the structure, size, colour and shape of the sporidia identical; while, on the contrary, species properly distinct have never presented to me sporidia of the same shape. How many times have I admired in ecstasy the inexhaustible fullness of the great Creator of all things, who has given to an organ essentially the same in its nature and office such an infinite variety of form, so that each species carries with it an invariable impress or token to distinguish it from its allies!

Still very far from the end I had proposed to myself, from want of time, and not being able to embrace a larger field, I confine myself at present to a notice respecting the tribe of indigenous *Pyrenomycetes Sphæriaceæ,* because on recurring to the examination of the most essential parts of the fruit, they exhibit on a small scale the basis on which I intend to proceed in their re-arrangement; re-arrangement I say, because Greville, Corda, Montagne, and Fries himself in the 'Plantæ Homonemeæ' felt the urgent necessity of lending a hand in the dismemberment of

the genus *Sphæria*, proposing the genera *Diplodia*, *Ostropa*, *Cucurbitaria*, *Cryptosphæria*, *Valsa* and *Hypocrea*, which conveniently limited according to the characters of fructification common to the greater number of the respective species, and selected from the heterogeneous materials which they everywhere contain, ought without doubt in some measure to be adopted, although for the most part founded on the appearance of the stroma, perithecia and nucleus, characters comparatively of small value.

I comprehend among the *Pyrenomycetes Sphæriaceæ*, those species only in which we meet with truly ascigerous conceptacula or perithecia, whether spheroidal, lentiform, conical, oval; whether obtuse or acute, or finally produced into a kind of cylindrical neck, angular or compressed, isolated or gregarious, or collected together in a stroma of varied form; opening by means of a vertical pore, sometimes scarcely visible or gaping in consequence of the thinness of the exterior coat, which yields readily to the shock of the sporidia bursting forth from the asci when arrived at maturity, or of the asci themselves separated from the walls of the perithecia, or in short by means of an irregular fissure.

The limits indeed within which the celebrated Corda has circumscribed the tribe or family of the *Sphæriaceæ*, in his immense iconographical work on the family of Fungi (Icones Fungorum, vol. v. p. 31), might be adopted for the present, had he not as I believe comprised in it genera which do not properly belong to it, and for the most part defined too loosely.

In the *Sphæriaceæ* we have to consider the stroma, the perithecium, its texture, the mode in which it opens, the nucleus, the asci, the paraphyses and the sporidia.

The stroma, on which the fundamental divisions of Fries are based, furnishes characters of some importance in the greater part of compound *Sphæriæ*, which, besides serving as a receptacle for the perithecia, presents a determined form characteristic of each species. The stroma cannot properly be compared to the thallus of Lichens, because it is an integral part of the fructifying apparatus. From the mycelium, the true equivalent of the thallus, one can scarcely draw materials for the diagnosis of the genera, because it is always extremely difficult to follow up its development. Deeply invested in the substance of the matrix or confluent with it, and often evanescent in fructifying individuals, it cannot afford precise characters except by the help of observations, often perhaps impracticable, and attentively following up the development before the evolution of the perithecia. In the simple, free, superficial or innate species, and in the *Cæspititiæ*, the nature of the stroma appears less clear, because in some species